GYPSY MOTH SUPPRESSION PROJECT SUMMARY
At
Blackwater National Wildlife Refuge
Part of the
Chesapeake Marshlands National Wildlife Refuge Complex
April 23, 2015

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On April 23, 2015, 500 acres at Blackwater National Wildlife Refuge, part of the Chesapeake Marshlands National Wildlife Refuge Complex, were aerially treated to reduce gypsy moth populations and to prevent defoliation. A single application of the biological insecticide Gypchek was applied at the rate of 4×10^{11} occlusion bodies per acre in a total formulation of 1 gallon per acre.

A rotary-winged aircraft equipped with a Differential Global Positioning System (DGPS) was used to apply the insecticide.

This report documents the spray equipment, insecticide, meteorological conditions, foliage and larval development, and spray coverage for the project. Treatment efficacy will be reported once defoliation levels are determined in June and egg mass surveys are completed this fall.

Aircraft and Spray Equipment

Contractor:	Helicopter Applicators, Inc
Aircraft:	Bell OH-58
FAA Number:	N654HA
Pilot:	Dan Riley
DGPS Brand:	AG-NAV
Spray System:	Simplex
Nozzle Type:	AU 5000 Micronairs
Number of Nozzles:	6
Blade Angle:	35°
VRU setting:	13
Application Rate:	1 gallon/ acre
Boom Pressure:	20 psi
Air Speed	70 mph
Swath Width:	125 feet
Flow Rate:	17.68 gpm (calculated)
	17.67 gpm (actual)

Calibration

The aircraft spray system was calibrated the afternoon before the treatment day at the helispot located on the open, grassy area just west of the fire shop at the Refuge. The calibration was conducted by the personnel from USDI Fish and Wildlife Refuge and assisted by personnel from the USDA Forest Service. Only one run through the calibration check was needed, no adjustments were needed.

Meteorological Conditions inside spray block at ground level taken by USDA FS

Time	Temperature (° F)	Relative Humidity (%)	Wind Speed
0630	45	50	1 mph
0644	45	54	Calm
0705	46	53	Calm
0732	47	55	1 mph
0750	49	55	2-4 mph
0806	50	50	2-4 mph, gusts 7 mph
0823	51	48	2-6 mph, gusts 10 mph
0834	51	46	4-6 mph, gusts 12 mph

Meteorological Conditions taken by USDI F&WS at the Helispot, open field

Time	Wind Speed
0620	4-5 mph
0714	3-5 mph
0757	7-8 mph, gusts 10 mph
0814	4-6 mph, (RH 32%)
0824	7-9 mph, gusts 12

Foliage and Larval Development

Foliage Development:

White oak	10-20%
Red oak	20-30%
Beech/Maple	20-35%

Larval Development:

100% first instars
(20% were late first instars)
98% larval dispersal

Spray Coverage

Based on observations made by USDA Forest Service personnel in the treatment block and by viewing the AGNAV system, spray coverage was excellent through the entire application. There were no unacceptable skips in the treatment block.

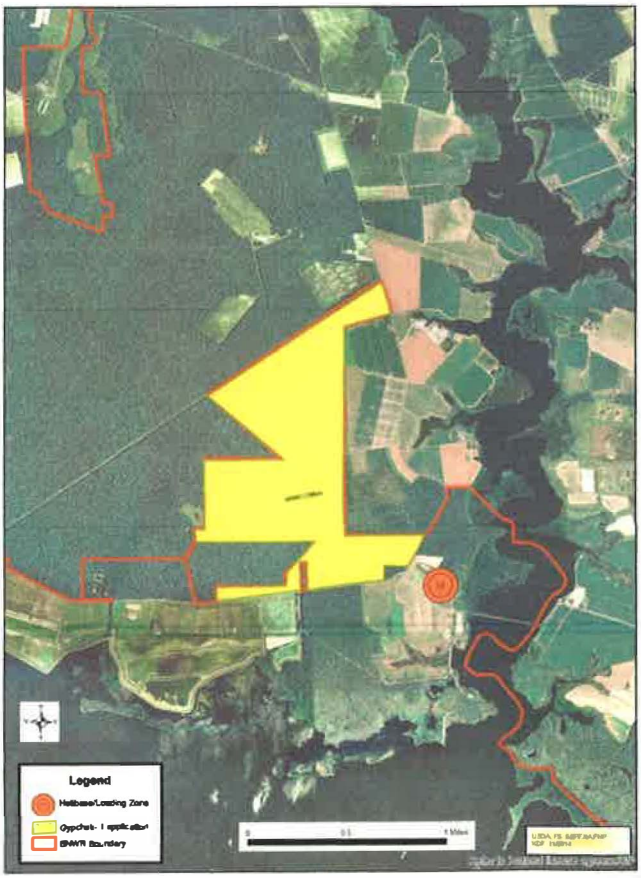
Narrative

Blackwater Wildlife Refuge personnel coordinated the project from the helispot. The aircraft took off at 0615, experienced GPS software problems and returned to the helipsot. The navigation software had been recently updated and had a few bugs in it. After the contractor contacted the software tech support, the system was up and running correctly within 40 minutes. A total of 7 loads were applied between 0616 and 0849. With the exception of the first load, the average turn- around time for the loads was 12.34 minutes.

The treatment timing based on the larval and foliage development and meteorological conditions inside the block were within acceptable limits.

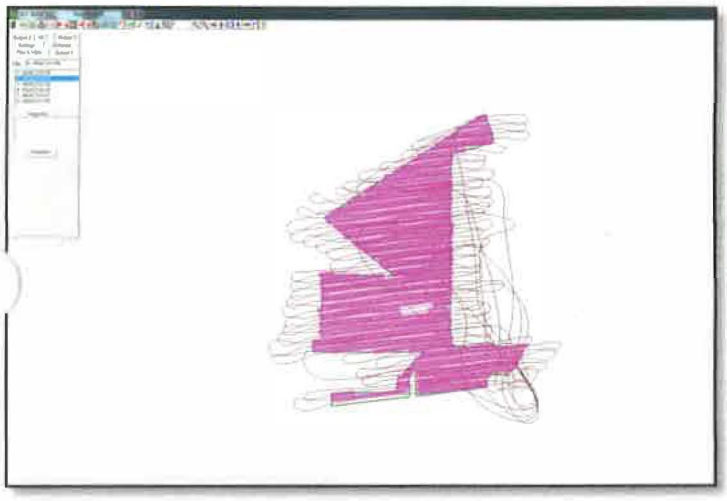
The effectiveness of aerial application of Gypchek will be evaluated using the Forest Health Technology Enterprise Team's (FHTET) Forest Disturbance Monitor and conducting ground inspections to do a post-suppression defoliation survey in June and an egg mass survey will be conducted in late summer/fall of 2015. The treatments will be considered successful if noticeable defoliation occurs on less than 20 percent of the treatment area and residual gypsy moth populations are reduced below the treatment threshold on 80 percent of the treatment area.

Kentuck Swamp Area - gypsy moth spray block.



Locations of spray block and helispot at Blackwater NWR.

Helicopter application of gypchek at BWNR.



AgNav map of gypchek application at BWNR.

Spray block at BWNR.